

Writing the Equation of a Quadratic Function

Method 1: Given Roots

Example: Write the equation of the quadratic with roots 3 and -5

$$\begin{array}{c} x = 3 \\ -3 \quad -3 \end{array}$$

and

$$\begin{array}{c} x = -5 \\ +5 \quad +5 \end{array}$$

$$x - 3 = 0$$

and

$$x + 5 = 0$$

$$(x - 3)(x + 5) = 0$$

$$x^2 + 5x - 3x - 15 = 0$$

$$\boxed{x^2 + 2x - 15 = 0}$$

You Do:

1) Roots 6 and 2

$$x =$$

and

$$x =$$

$$= 0$$

and

$$= 0$$

$$(\quad)(\quad) = 0$$

$$= 0$$

2) Roots -4 and 5

Method 2: Given vertex and a point

Example: Write the equation of the quadratic function with a vertex of $(-2, 3)$ through the point $(1, 9)$

Use vertex form: $y = a(x-h)^2 + k$ because _____

$$y = a(x+2)^2 + 3$$

$$9 = a(1+2)^2 + 3$$

$$9 = a(3)^2 + 3$$

$$9 = 9a + 3$$

$$6 = 9a$$

$$a = \frac{6}{9} = \frac{2}{3}$$

$$y = \frac{2}{3}(x+2)^2 + 3$$

You Do

1) Vertex $(1, 6)$ through $(3, 20)$

2) Vertex $(-4, -1)$ through $(0, 15)$ ^{y-intercept!}

$$y = a(x-h)^2 + k$$

$$y = a(x \quad)^2$$

$$= a(\quad)^2$$

$a =$

$y =$